

What is claimed is: **(for US)**

1. A sequence display method, comprising:  
a first step of accepting, by a sequence display device, information relating to mutations or similarities between a plurality of similar nucleotide sequences or amino acid sequences; and
- 5 a second step of adding visual characteristics according to said mutations or similarities and displaying said plurality of similar nucleotide sequences or amino acid sequences.
2. A sequence display method according to claim 1, wherein said visual characteristics are added to regions of mutation and/or regions of similarity in said plurality of similar nucleotide sequences or amino acid sequences.
3. A sequence display method according to claim 1, wherein said visual characteristics are added in accordance with the degree of said mutation and/or similarity.
4. A sequence display method according to claim 2, wherein said visual characteristics are added in accordance with the frequency of mutation in said regions of mutation.
5. A sequence display method according to claim 2, wherein said visual characteristics are added based on amino acid information that includes the names and properties of amino acids that correspond to codons in said plurality of similar nucleotide sequences.

6. A sequence display method according to claim 1, wherein said visual characteristics are displayed using display color.

7. A sequence display method according to claim 1, wherein said visual characteristics are displayed using variation of display color.

8. A sequence display method according to claim 1, wherein said visual characteristics are displayed using varieties of characters.

9. A sequence display method according to claim 1, wherein, in said second step, corresponding nucleotides or amino acids in each sequence are displayed in alignment.

10. A sequence display method according to claim 1, further comprising a third step of adding links between said plurality of similar nucleotide sequences or amino acid sequences and/or links to relevant information.

11. A sequence display device, comprising:

a first means for accepting information relating to mutation and/or similarity in a plurality of similar nucleotide sequences or amino acid sequences; and

5 a second means for adding visual characteristics in accordance with said mutation and/or similarity and displaying said plurality of similar nucleotide sequences or amino acid sequences.

12. A sequence display device according to claim 11, wherein said second means adds said visual characteristics to regions of mutation and/or regions of similarity in said plurality of similar nucleotide sequences or amino acid sequences.

13. A sequence display device according to claim 11, wherein said second means adds said visual characteristics in accordance with the degree of said mutation and/or said similarity.

14. A sequence display device according to claim 12, wherein said second means adds said visual characteristics in accordance with the frequency of mutation in said regions of mutation.

15. A sequence display device according to claim 12, wherein said second means adds said visual characteristics based on amino acid information that includes the names and properties of amino acids that correspond to codons in said plurality of similar nucleotide sequences.

16. A sequence display device according to claim 11, wherein said second means represents said visual characteristics using display color.

17. A sequence display device according to claim 11, wherein said second means represents said visual characteristics using variation of display color.

18. A sequence display device according to claim 11, wherein said second means represents said visual characteristics using varieties of characters.

19. A sequence display device according to claim 11, wherein said second means displays with corresponding nucleotides or amino acids in each sequence in alignment.

20. A sequence display device according to claim 11, further comprising third means for adding links between said plurality of similar nucleotide sequences or amino acid sequences and/or links to relevant information.

21. A sequence display program product for causing a computer to execute each of the steps described in claim 1.

22. A sequence display program product for causing a computer to execute each of the steps described in claim 2.

23. A sequence display program product for causing a computer to execute each of the steps described in claim 3.

24. A sequence display program product for causing a computer to execute each of the steps described in claim 4.

25. A sequence display program product for causing a computer to

execute each of the steps described in claim 5.

26. A sequence display program product for causing a computer to execute each of the steps described in claim 6.

27. A sequence display program product for causing a computer to execute each of the steps described in claim 7.

28. A sequence display program product for causing a computer to execute each of the steps described in claim 8.

29. A sequence display program product for causing a computer to execute each of the steps described in claim 9.

30. A sequence display program product for causing a computer to execute each of the steps described in claim 10.

31. A recording medium on which is recorded a sequence display program for causing a computer to execute each of the steps described in claim 1 and that can be read by a computer.

32. A recording medium on which is recorded a sequence display program for causing a computer to execute each of the steps described in claim 2 and that can be read by a computer.

33. A recording medium on which is recorded a sequence display

program for causing a computer to execute each of the steps described in claim 3 and that can be read by a computer.

34. A recording medium on which is recorded a sequence display program for causing a computer to execute each of the steps described in claim 4 and that can be read by a computer.

35. A recording medium on which is recorded a sequence display program for causing a computer to execute each of the steps described in claim 5 and that can be read by a computer.

36. A recording medium on which is recorded a sequence display program for causing a computer to execute each of the steps described in claim 6 and that can be read by a computer.

37. A recording medium on which is recorded a sequence display program for causing a computer to execute each of the steps described in claim 7 and that can be read by a computer.

38. A recording medium on which is recorded a sequence display program for causing a computer to execute each of the steps described in claim 8 and that can be read by a computer.

39. A recording medium on which is recorded a sequence display program for causing a computer to execute each of the steps described in claim 9 and that can be read by a computer.

40. A recording medium on which is recorded a sequence display program for causing a computer to execute each of the steps described in claim 10 and that can be read by a computer.

41. A homology search method, comprising:

a fourth step of analyzing a query to a sequence database that has been submitted by a user;

5 a fifth step of generating search conditions that are appropriate for said sequence database based on the analysis results of said fourth step and searching said sequence database;

a sixth step of analyzing the search results of said fifth step and generating information relating to mutations and/or similarities in a plurality of similar nucleotide sequences or amino acid sequences; and

10 a seventh step of using information that has been generated in said sixth step and a sequence display method described in claim 1 to display search results of said fifth step.

42. A homology search method, comprising:

a fourth step of analyzing a query to a sequence database that has been submitted by a user;

5 a fifth step of generating search conditions that are appropriate for said sequence database based on the analysis results of said fourth step and searching said sequence database;

a sixth step of analyzing the search results of said fifth step and generating information relating to mutations and/or similarities in a plurality of

similar nucleotide sequences or amino acid sequences; and

- 10           a seventh step of using information that has been generated in said sixth step and a sequence display method described in claim 2 to display search results of said fifth step.

43.     A homology search method, comprising:

          a fourth step of analyzing a query to a sequence database that has been submitted by a user;

- a fifth step of generating search conditions that are appropriate for said  
5   sequence database based on the analysis results of said fourth step and searching said sequence database;

          a sixth step of analyzing the search results of said fifth step and generating information relating to mutations and/or similarities in a plurality of similar nucleotide sequences or amino acid sequences; and

- 10           a seventh step of using information that has been generated in said sixth step and a sequence display method described in claim 3 to display search results of said fifth step.

44.     A homology search method, comprising:

          a fourth step of analyzing a query to a sequence database that has been submitted by a user;

- a fifth step of generating search conditions that are appropriate for said  
5   sequence database based on the analysis results of said fourth step and searching said sequence database;

          a sixth step of analyzing the search results of said fifth step and generating information relating to mutations and/or similarities in a plurality of



similar nucleotide sequences or amino acid sequences; and

- 10           a seventh step of using information that has been generated in said sixth step and a sequence display method described in claim 4 to display search results of said fifth step.

45.     A homology search method, comprising:

          a fourth step of analyzing a query to a sequence database that has been submitted by a user;

- a fifth step of generating search conditions that are appropriate for said  
5   sequence database based on the analysis results of said fourth step and searching said sequence database;

          a sixth step of analyzing the search results of said fifth step and generating information relating to mutations and/or similarities in a plurality of similar nucleotide sequences or amino acid sequences; and

- 10           a seventh step of using information that has been generated in said sixth step and a sequence display method described in claim 5 to display search results of said fifth step.

46.     A homology search method, comprising:

          a fourth step of analyzing a query to a sequence database that has been submitted by a user;

- a fifth step of generating search conditions that are appropriate for said  
5   sequence database based on the analysis results of said fourth step and searching said sequence database;

          a sixth step of analyzing the search results of said fifth step and generating information relating to mutations and/or similarities in a plurality of

similar nucleotide sequences or amino acid sequences; and

- 10           a seventh step of using information that has been generated in said sixth step and a sequence display method described in claim 6 to display search results of said fifth step.

47.     A homology search method, comprising:

          a fourth step of analyzing a query to a sequence database that has been submitted by a user;

- a fifth step of generating search conditions that are appropriate for said  
5   sequence database based on the analysis results of said fourth step and searching said sequence database;

          a sixth step of analyzing the search results of said fifth step and generating information relating to mutations and/or similarities in a plurality of similar nucleotide sequences or amino acid sequences; and

- 10           a seventh step of using information that has been generated in said sixth step and a sequence display method described in claim 7 to display search results of said fifth step.

48.     A homology search method, comprising:

          a fourth step of analyzing a query to a sequence database that has been submitted by a user;

- a fifth step of generating search conditions that are appropriate for said  
5   sequence database based on the analysis results of said fourth step and searching said sequence database;

          a sixth step of analyzing the search results of said fifth step and generating information relating to mutations and/or similarities in a plurality of

similar nucleotide sequences or amino acid sequences; and

- 10           a seventh step of using information that has been generated in said sixth step and a sequence display method described in claim 8 to display search results of said fifth step.

49.     A homology search method, comprising:

          a fourth step of analyzing a query to a sequence database that has been submitted by a user;

- a fifth step of generating search conditions that are appropriate for said  
5   sequence database based on the analysis results of said fourth step and searching said sequence database;

          a sixth step of analyzing the search results of said fifth step and generating information relating to mutations and/or similarities in a plurality of similar nucleotide sequences or amino acid sequences; and

- 10           a seventh step of using information that has been generated in said sixth step and a sequence display method described in claim 9 to display search results of said fifth step.

50.     A homology search method, comprising:

          a fourth step of analyzing a query to a sequence database that has been submitted by a user;

- a fifth step of generating search conditions that are appropriate for said  
5   sequence database based on the analysis results of said fourth step and searching said sequence database;

          a sixth step of analyzing the search results of said fifth step and generating information relating to mutations and/or similarities in a plurality of

similar nucleotide sequences or amino acid sequences; and

- 10           a seventh step of using information that has been generated in said sixth step and a sequence display method described in claim 10 to display search results of said fifth step.

51.     A homology search device, comprising:

          a fourth means for analyzing a query to a sequence database that has been submitted by a user;

- a fifth means for generating search conditions that are appropriate for  
5   said sequence database based on analysis results produced by said fourth means and searching said sequence database;

          a sixth means for analyzing search results produced by said fifth means and generating information relating to mutations and/or similarities in a plurality of similar nucleotide sequences or amino acid sequences; and

- 10           a seventh means for using information that has been generated by said sixth means and a sequence display device according to claim 11 to display search results produced by said fifth means.

52.     A homology search device, comprising:

          a fourth means for analyzing a query to a sequence database that has been submitted by a user;

- a fifth means for generating search conditions that are appropriate for  
5   said sequence database based on analysis results produced by said fourth means and searching said sequence database;

          a sixth means for analyzing search results produced by said fifth means and generating information relating to mutations and/or similarities in a plurality

of similar nucleotide sequences or amino acid sequences; and

- 10        a seventh means for using information that has been generated by said sixth means and a sequence display device according to claim 12 to display search results produced by said fifth means.

53.     A homology search device, comprising:

      a fourth means for analyzing a query to a sequence database that has been submitted by a user;

- a fifth means for generating search conditions that are appropriate for  
5    said sequence database based on analysis results produced by said fourth means and searching said sequence database;

      a sixth means for analyzing search results produced by said fifth means and generating information relating to mutations and/or similarities in a plurality of similar nucleotide sequences or amino acid sequences; and

- 10       a seventh means for using information that has been generated by said sixth means and a sequence display device according to claim 13 to display search results produced by said fifth means.

54.     A homology search device, comprising:

      a fourth means for analyzing a query to a sequence database that has been submitted by a user;

- a fifth means for generating search conditions that are appropriate for  
5    said sequence database based on analysis results produced by said fourth means and searching said sequence database;

      a sixth means for analyzing search results produced by said fifth means and generating information relating to mutations and/or similarities in a plurality

of similar nucleotide sequences or amino acid sequences; and

- 10           a seventh means for using information that has been generated by said sixth means and a sequence display device according to claim 14 to display search results produced by said fifth means.

55.     A homology search device, comprising:

          a fourth means for analyzing a query to a sequence database that has been submitted by a user;

- a fifth means for generating search conditions that are appropriate for  
5   said sequence database based on analysis results produced by said fourth means and searching said sequence database;

          a sixth means for analyzing search results produced by said fifth means and generating information relating to mutations and/or similarities in a plurality of similar nucleotide sequences or amino acid sequences; and

- 10           a seventh means for using information that has been generated by said sixth means and a sequence display device according to claim 15 to display search results produced by said fifth means.

56.     A homology search device, comprising:

          a fourth means for analyzing a query to a sequence database that has been submitted by a user;

- a fifth means for generating search conditions that are appropriate for  
5   said sequence database based on analysis results produced by said fourth means and searching said sequence database;

          a sixth means for analyzing search results produced by said fifth means and generating information relating to mutations and/or similarities in a plurality

of similar nucleotide sequences or amino acid sequences; and

- 10           a seventh means for using information that has been generated by said sixth means and a sequence display device according to claim 16 to display search results produced by said fifth means.

57.     A homology search device, comprising:

          a fourth means for analyzing a query to a sequence database that has been submitted by a user;

- a fifth means for generating search conditions that are appropriate for  
5   said sequence database based on analysis results produced by said fourth means and searching said sequence database;

          a sixth means for analyzing search results produced by said fifth means and generating information relating to mutations and/or similarities in a plurality of similar nucleotide sequences or amino acid sequences; and

- 10           a seventh means for using information that has been generated by said sixth means and a sequence display device according to claim 17 to display search results produced by said fifth means.

58.     A homology search device, comprising:

          a fourth means for analyzing a query to a sequence database that has been submitted by a user;

- a fifth means for generating search conditions that are appropriate for  
5   said sequence database based on analysis results produced by said fourth means and searching said sequence database;

          a sixth means for analyzing search results produced by said fifth means and generating information relating to mutations and/or similarities in a plurality

of similar nucleotide sequences or amino acid sequences; and

- 10           a seventh means for using information that has been generated by said sixth means and a sequence display device according to claim 18 to display search results produced by said fifth means.

59.     A homology search device, comprising:

          a fourth means for analyzing a query to a sequence database that has been submitted by a user;

- a fifth means for generating search conditions that are appropriate for  
5   said sequence database based on analysis results produced by said fourth means and searching said sequence database;

          a sixth means for analyzing search results produced by said fifth means and generating information relating to mutations and/or similarities in a plurality of similar nucleotide sequences or amino acid sequences; and

- 10           a seventh means for using information that has been generated by said sixth means and a sequence display device according to claim 19 to display search results produced by said fifth means.

60.     A homology search device, comprising:

          a fourth means for analyzing a query to a sequence database that has been submitted by a user;

- a fifth means for generating search conditions that are appropriate for  
5   said sequence database based on analysis results produced by said fourth means and searching said sequence database;

          a sixth means for analyzing search results produced by said fifth means and generating information relating to mutations and/or similarities in a plurality



of similar nucleotide sequences or amino acid sequences; and

- 10           a seventh means for using information that has been generated by said sixth means and a sequence display device according to claim 20 to display search results produced by said fifth means.

61.     A homology search device according to claim 51, further comprising an eighth means for controlling the operation of the fourth means, the fifth means, the sixth means, and the seventh means.

62.     A homology search program product for causing a computer to execute each of the steps described in claim 41.

63.     A recording medium on which is recorded a homology search program for causing a computer to execute each of the steps described in claim 41 and that can be read by a computer.